The Part Played by Heterogeneous Elastic Deformation in Microregions of Carbon Steel During Strengthening by Cold Plastic Deformation

77689
SOV/148-60-1-12/34

Figures 1 and 2 show that the change of E, depending on ε , follows a linear law.

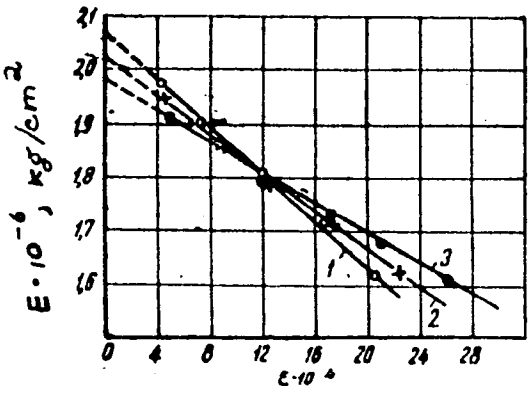

Fig. 1. Relation between change of true value of Young's modulus and relative deformation in elastic region at various values of preliminary plastic elongations (steel 15): (1) $\varepsilon_{пл}$ = 5.3%; (2) $\varepsilon_{пл}$ = 10.2%; (3) $\varepsilon_{пл}$ = 17.6%

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The Part Played by Heterogeneous Elastic Deformation in Microregions of Carbon Steel During Strengthening by Cold Plastic Deformation

77689
SOV/148-60-1-12/34

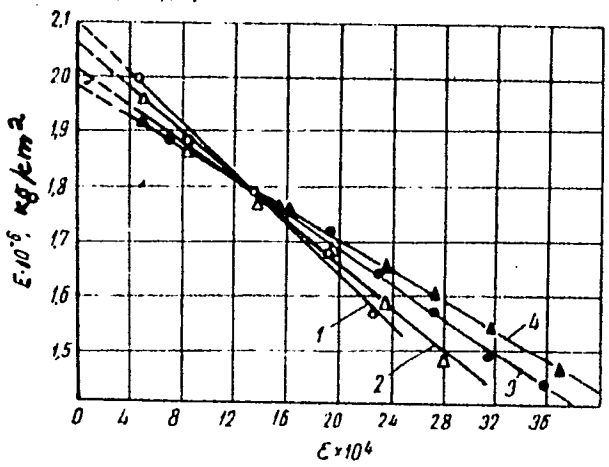

Fig. 2.

Card 6/12 See Card 7/12 for caption.

Caption to Fig. 2. on Card 6/12.

Fig. 2. Relation between change of true value of Young's modulus and relative deformation in elastic region of various values of preliminary plastic elongation (steel 30): (1) $\varepsilon_{пп}$ = 1.2%; (2) $\varepsilon_{пп}$ = 2.6%; (3) $\varepsilon_{пп}$ = 6.9%; (4) $\varepsilon_{пп}$ = 10.3%.

Equation (3) shows that modulus of microplasticity can be determined by angle α, which is formed by straight line $E = f(\varepsilon)$ with axis ε because:

$$\operatorname{tg}\alpha = \frac{E_0^2}{2\Pi}. \qquad (4)$$

The investigation showed that modulus Π increases with the increase of cold plastic deformation (see Table A).

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Table A. Relation of yield point, modulus of microplasticity, and their ratio and the value of preliminary plastic elongation.

Material	Treatment	$\varepsilon_{пл}$ %	σ_1 kg/cm^2	Π kg/cm^2	$\frac{\sigma_1}{\Pi}$
Steel 10	Annealing	3,0	2 630	8 420	0,31
»	»	5,6	3 190	9 900	0,32
»	»	10,9	3 830	11 800	0,32
»	»	20,0	4 430	14 100	0,31
Steel 15	Normalizing	5,3	4 210	9 740	0,43
»	»	10,2	4 950	11 300	0,44
»	»	17,6	5 530	13 200	0,42

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Referring to his previous work (A. V. Gur'yev, Journal of Technical Physics, 1954, 24, Nr 9, 1644), the author writes an equation for the relative part of cross sectional area, which is encompassed by plastic shears (during elastic deformation of the mass of microvolumes) under repeated loadings, as:

$$f_{\text{пл}} = 1 - \sqrt{1 - \frac{\sigma}{\Pi}} \qquad (5)$$

Calculations based on Eq. 5 show that for steel 10 $f_{\text{пл}}$ is about 20% and for steel 15, about 25%. The evaluation of microstresses is made by Eq. (6):

$$\sigma_y = \Pi\left[2\sqrt{1 - \frac{\sigma_r}{\Pi}} - \sqrt{1 - 2\frac{\sigma_r}{\Pi}} - 1\right], \qquad (6)$$

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The curves of changes of σ_y for two types of steel are

given in Fig. 3.

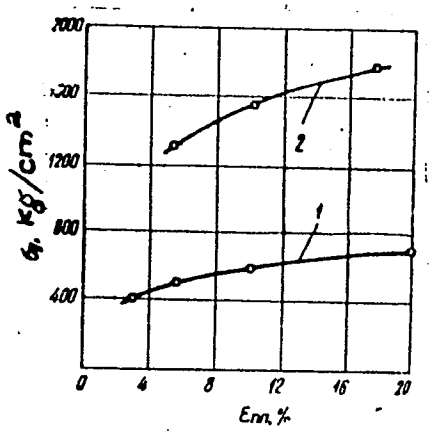

Fig. 3. Residual microstresses after plastic elongation: (1) steel 10; (2) steel 15.

Card 10/12 Fig. 3.

The Part Played by Heterogeneous Elastic Deformation in Microregions of Carbon Steel During Strengthening by Cold Plastic Deformation

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Previous work of G. V. Kurdyumov and his collaborators is mentioned. The author arrived at the following conclusions: (1) As a result of strengthening the steel by plastic deformation, the capacity to resist microplastic shear in the elastic region of loading is increased. (2) The growth of the second type stresses (shear) is an inevitable result of strengthening the alloy by plastic deformation. (3) There is a direct connection between the change of modulus of microplasticity Γ and the growth of strengthening. The ratio of yield point to the modulus of microplasticity of strengthened alloy proves to be a constant. This indicates that the transition of local microplastic shears into the microplastic deformation of the sample takes place after a certain correlation between the elastic and nonelastic microregion of alloy (under the influence

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of deformation) is reached. The processing of experimental data shows that the critical value $f_{\Pi T}$ for steel in such a case reaches 20-30%. There are 3 figures; 1 table; and 9 references, 8 Soviet, 1 U.K. The U.K. reference is: W. A. Rachinger, Journ. Inst. Metals, 1952, 81, 33.

ASSOCIATION: Stalingrad Mechanical Institute (Stalingradskiy mekhanicheskiy institut)

SUBMITTED: October 21, 1958

Card 12/12

35287

S/148/60/000/003/002/018
E073/E535

18.6200

AUTHOR: Gur'yev, A.V.

TITLE: On residual microstresses which develop in a polycrystalline specimen under conditions of plastic deformation

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Chernaya metallurgiya, 1960, No 3, pp 17-21

TEXT: From the changes in the parameters of the strain-load relief curve of a specimen, the magnitudes of residual microstresses and the range of fluctuations of these microstresses about a mean value were determined. The relation between "weak" and "strong" micro-areas of a real polycrystalline alloy during plastic deformation is estimated, a method of investigation which has not been used hitherto. It can be assumed that the first instantaneous loading will lead to purely elastic deformation. A polycrystalline alloy, which is a conglomeration of crystals with differing orientations with a continuous interlinking of the grain boundaries, is basically a non-uniform medium. With increasing load, an increasing part of the "weakest" and the most

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unfavourably oriented micro-areas will become plastically deformed. The increase in area (or volume) of the region which is plastically deformed will be proportional to the increase of the real stress taken up by those micro-areas:

$$df_{пл} = \frac{1}{\Pi} d\sigma_y, \qquad (1)$$

where Π is a new constant of the material, referred to by the author as "modulus of microplasticity". It can be seen from Eq.(1) that the reciprocal of Π is numerically equal to the relative part of the volume which becomes plastically deformed on increasing the real stress by 1 kg/cm^2. The deformation of the specimen as a whole will be considered as being elastic in strain measurements until the fraction of plastically deforming micro-volumes is small against a general background of elastic deformation. This picture of the development of plastic deformation corresponds with modern views if the fact is taken into consideration that plastic deformation originates in a very small volume and proceeds highly non-uniformly in the polycrystalline alloy;

there will be non-uniform deformation of the various grains, inside each grain and also a deorientation of the individual grains and blocks. From Eq.(1) an equation is derived for the deformation during the first loading which will be a parabola. With increasing load, the fraction of plastic deformation will increase and fuse into a macro-area. Analysis of an equation which is derived in the paper indicates that the ratio of the yield point of a material which has been work-hardened by plastic deformation to the modulus of microplasticity cannot exceed the value of 0.5 and this conclusion is in good agreement with experimental results obtained for steels 10 and 15 for which the values were 0.32 and 0.43, respectively. Due to redistribution of stresses along the micro-areas, the stress-strain relation during load relief will again be parabolic, as was shown in earlier work of the author (Ref.3: ZhTF, 1954, Vol.24, No.9). An equation is derived which determines the average value of the residual microstresses, i.e. the scatter between the maximum and minimum values. It was found that the average residual micro-stresses after plastic deformation in tension are compressive and

their value depends only on the modulus of microplasticity of the work-hardened alloy and the ratio σ_T/Π. This result confirms conclusively the absence of residual distortions of the atomic lattice during plastic deformation and the"Wood and Smith effect" will no longer exist, since the existence of residual microstresses and their sign is fully elucidated by the non-uniformity of the process of plastic deformation along the micro-areas of the real polycrystalline alloy. This confirms earlier expressed views that the magnitude of residual microstresses characterizes the degree of non-uniform elastic deformation of micro-areas of the alloy and is determined by the limit of elastic deformation in the micro-volumes. In investigations with standard circular specimens of 10 mm diameter of the steel 15, the following stress values were obtained for various degrees of plastic deformation, $\varepsilon_{\Pi\Pi}$:

$\varepsilon_{\Pi\Pi}$, %	$\sigma^{o}_{y_{max}}$, kg/mm^2	$\sigma^{o}_{y_{min}}$, kg/mm^2	$\sigma^{o}_{y_{av}}$, kg/mm^2
5	13	-24	-5
10	16	-28	-6
18	17	-32	-8

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The strain was measured with a strain gauge of high accuracy. From the experimental data the modulus of microplasticity, which is necessary for calculating the residual microstresses, was determined by means of formulae given in an earlier paper of the author (Ref.4: Izvestiya vysshikh uchebnykh zavedeniy, Chernaya metallurgiya, 1960, No.1). A plot is included which shows the field of scatter of the residual microstresses (σ_y, kg/mm^2) which are distributed along "strong" and "weak" micro-areas of steel 10 after various degrees of plastic deformation, $\varepsilon_{пл}$,% (curve 1 - maximum tensile stresses, curve 2 - minimum compressive stresses, curve 3 - average magnitude of residual microstresses.. The zone of scatter of the tensile and compressive stresses, which are distributed along strong and weak micro-areas, is hatched). The tabulated data and the graph show that the changes in the microstresses with increasing plastic deformation are in good agreement with results determined by X-ray analysis by other authors. This confirms the validity of the main assumptions of the proposed theory and provides a method of studying the mechanism of deformation of real polycrystalline alloys from the changes in the parameters of the deformation load relief curve; also a

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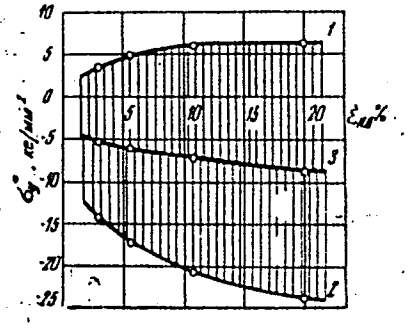
new constant of the material is introduced - the modulus of microplasticity, the magnitude of which reflects the degree of non-uniformity of the deformation along the individual micro-areas. There are 1 figure and 5 Soviet references.

ASSOCIATION: Stalingradskiy mekhanicheskiy institut (Stalingrad Institute of Mechanics)

SUBMITTED: May 11, 1959



Card 6/6 Figure

88060

10.9220 also 2808

S/139/60/000/006/029/032
E073/E435

AUTHOR: [redacted]

TITLE: Investigation of the Incubation Period of Fatigue of Metals

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Fizika, 1960, No.6, pp.170-171

TEXT: In another paper (Ref.1), the author presented a new idea on the development and accumulation of fatigue changes in metals. The entire process from the first loading up to the time of failure is sub-divided into three clearly distinguishable periods in each of which a particular type of accumulation of fatigue changes occurs. During the first, "incubation" period distortions accumulate in the sub-microscopic volumes (coagulation of vacancies, movement of dislocations, diffusion processes in the loaded state). After reaching the "limit of the incubation damage", repeated plastic deformations may occur in odd individual micro-zones; this characterizes the transition into the second period of fatigue, "the period of

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Investigation of the Incubation Period of Fatigue of Metals

evident damage" of the material. During the second period, local micro-plastic deformations will develop and new micro-zones of the alloy will participate in the plastic deformation. This process cannot proceed endlessly and after reaching a certain ratio between the elastically and plastically deforming micro-zones (the limit of evident damage) fusion of plastically deformed micro-zones into a larger macro-zone becomes possible along selected directions and the process of fatigue enters the final stage. In the same way as during single loading, repeated plastic deformation along these regions will lead to an exhaustion of the plasticity and to the development of fatigue cracks and failure of the specimen. In this paper, the results are described of experimental investigations of the metal fatigue during the first "incubation" period. Pure bending tests were carried out on 10mm dia specimens rotating at 6000 rpm of the steels Ст 10 (Steel 10), Ст 15 (Steel 15), Ст 35 (Steel 35), Ст 40 (Steel 40) and Ст 45 (Steel 45). With the termination of the "incubation" period, plastic

Investigation of the Incubation Period of Fatigue of Metals

deformation of individual odd micro-zones of the alloy will start, which is immediately reflected in a change of the dimensions of the loop of the elastic hysteresis and a new constant of the material, the "modulus of micro-plasticity". The same experimental technique and evaluation of the results was applied as in the previous work of the author (Ref.1). In Fig 1, the dependence is plotted, in semi-logarithmic coordinates, of the duration of the incubation period on the maximum cycle stress (σ, kg/mm^2 vs N_i) for the steels: Steel 45 (Curve 1); Steel 35 (Curve 2); Steel 15 (Curve 3); Steel 10 (Curve 4); o - experimental values of the duration of the incubation period (cycles) as a function of the maximum cycle stress. The graph shows that for all the tested materials the experimental points lie on a straight line with satisfactory accuracy. It is pointed out that no differing features were observed in the accumulation of fatigue changes for loads above and below the fatigue limit. In all the curves, fatigue limits are designated by - The straight

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lines do not show a discontinuity at that point, which indicates that in the initial stage the accumulation of fatigue changes in the metal proceeds in accordance with the same law regardless of the magnitude of the stress, only the intensity will differ. Since the duration of the incubation period N_i as a function of the maximum cycle stress σ is represented by a straight line in semi-logarithmic coordinates, this dependence can be analytically expressed by the equation

$$N_i = ae^{b\sigma} \qquad (1)$$

where a and b are specific material constants. The physical meaning of these constants is more evident if the above equation is written as follows

$$N_i = N_i^o e^{-\ln N_i^o \frac{\sigma}{\sigma^o}}$$

Investigation of the Incubation Period of Fatigue of Metals

Let us assume that Eq.(1) is valid also for the limit test conditions, then N_1^o limit duration of the incubation period, i.e number of loading cycles for which the incubation period proceeds with an infinitely small loading, σ^o - maximum cycle stress at which the incubation period will occur in a single load cycle. For the investigated steels, the constants σ^o and N_1^o were as follows:

	σ^o kg/mm^2	N_1^o cycles
Steel 10	29.3	2.61×10^{17}
Steel 35	36.0	1.32×10^{15}
Steel 45	39.3	7.05×10^{15}

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S/139/60/000/006/029/032
E073/E435

Investigation of the Incubation Period of Fatigue of Metals

During the entire incubation period there should be no serious distortions of the regular crystal structure, which would lead directly to opening up of fatigue cracks (Ref. 1). The influence of preliminary loading cycles equalling N_0 at stresses above and below the fatigue limit were investigated. No positive or negative influence of such loading cycles could be detected. Consequently, in this period loading cycles with stresses above the fatigue limit do not bring about "damage phenomena" (according to French, Ref. 3). Absence of a positive effect of loading cycles below the fatigue limit, as long as the number of cycles do not exceed the incubation period, indicates absence during this period of a process of hardening which is the basis of the presented theory of fatigue failure, assuming that during the first period the process of plastic deformation in new micro-zones of the alloy does not as yet take place. In view of this, the known fact will be understood that the positive effect of "training cycles" with stresses below the fatigue limit occurs only after a certain (for each stress level)

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S/139/60/000/006/029/032
E073/E435

Investigation of the Incubation Period of Fatigue of Metals

sufficiently large number of cycles (Ref 4). Absence of work hardening in the incubation period was confirmed by measuring the hardness of the material with increasing number of loading cycles. The hardness was measured by a Rockwell instrument Scale B. The variance of the hardness values is within the limits of experimental error. The results of the investigation of the process of the fatigue of metal during the second and third period will be presented in a separate paper. There are 1 figure, 1 table and 4 Soviet references.

Note: This is an almost complete translation.

ASSOCIATION: Stalingradskiy mekhanicheskiy institut
(Stalingrad Institute of Mechanics)

SUBMITTED: April 11, 1960

Card 3/3

GUR'YEV, A.V.

Effect of local microheterogenous deformations of a real polycrystalline alloy on the deformation of the entire specimen in the elastic region. Fiz. met. i metalloved. 11 no. 2:318-319 F '61. (MIRA 14:5)

1. Stalingradskiy mekhanicheskiy institut.
(Alloys--Metallography) (Deformations (Mechanics))

39753
S/126/62/014/001/009/018
E193/E383

18.8200

AUTHOR: Gur'yev, A.V.

TITLE: On the role of microplastic deformation in metal fatigue

PERIODICAL: Fizika metallov i metallovedeniye, v. 14, no. 1, 1962, 99 - 105

TEXT: Since fatigue failure is always preceded by microplastic deformation it is reasonable to expect that a study of the variation in the intensity of this process would throw some light on the mechanism of fatigue failure - hence the present investigation conducted on several carbon steels (10, 15, 20, 35 and 45). Changes in the extent of microplastic deformation were determined indirectly from the elastic hysteresis loops. To this end, a series of fatigue tests were conducted on rotating bar test pieces stressed in pure bending. Each test was periodically interrupted and, in addition to hardness (HRB) measurements, the elastic hysteresis loop was obtained for the test piece extended under the stress applied in the given fatigue test. Since each branch of a hysteresis loop can be described by

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the equation:

$$\varepsilon = \frac{2\Pi}{E_o}\left(1 - \sqrt{1 - \frac{\sigma}{\Pi}}\right) \qquad (1)$$

where E_o is the elastic modulus,

σ the applied stress and

Π a constant characterizing the intensity of the process of elastic strains changing to microplastic deformation

and since the relative part of the volume (or cross-section area) of the test piece undergoing microplastic deformation f is given by:

$$f = 1 - \sqrt{1 - \frac{\sigma}{\Pi}} \qquad (2)$$

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both σ_1 and f can be obtained from the elastic hysteresis loops by the method described in an earlier paper (FMM, 7, no.4, 1959, 586). Typical results obtained for steel 10, tested under a stress 7% higher than the fatigue limit, are reproduced in Fig. 2, where the magnitude of f (lower lefthand scale, curve 1), $\Delta\sigma/\sigma_{min}$ % (upper lefthand scale, curve 2) and ΔHRB/HRB, % (righthand scale, curve 3) are plotted against the number of cycles N. A similar graph, constructed for steel 10, tested under a stress 5% lower than the fatigue limit, is reproduced in Fig. 3. On the basis of the results obtained, the present author postulated that the process of fatigue failure can be divided into three stages (marked I, II and III in Fig. 2). Stage I can be regarded as the incubation period since in this stage of the process neither growth of the localized plastic microstrain takes place (i.e. f remains equal to 0) nor work-hardening occurs (see the hardness curve in Fig. 2), although submicroscopic distortions of the material in this stage can be revealed by X-ray analysis. This indicates that the process of formation of plastic microstrains cannot begin until a given

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concentration of lattice distortions has been attained. Consequently, the duration of the incubation period should depend on the concentration of defects of this type in the starting material; this was confirmed experimentally since preliminary plastic deformation of several percent. had reduced the duration of the incubation period to N = 0 cycles. In stage II gradual build-up of microstrains takes place (compare curve 1 in Fig. 2). It is a point of interest that this highly localized plastic deformation does not bring about an increase in the strength of the metal (see curve 2 in Fig. 2); on the contrary, in a sense the material becomes weaker since its resistance to the formation of new, plastically deformed micro-regions becomes lower, as indicated by a gradual decrease in [illegible] (curve 3 in Fig. 2). Work-hardening in the conventional sense begins only after a sufficiently high density of the plastically deformed microregions has been attained. The density of the plastically deformed microregions cannot increase indefinitely; on reaching a critical value of $f = f_k$ it will be possible

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On the role of ....

for a number of microregions to form a plastically-deformed macroregion, which should change basically the subsequent process of accumulation of damage in the material. That such is the case is clearly demonstrated by the graphs in Fig. 2; as in the case of static loading, the plasticity of the material is exhausted by repeated plastic deformation, which leads to the formation of cracks and to ultimate failure of the specimen. Thus, stage III of the fatigue failure begins, when f reaches its critical value. The continued increase in hardness during this stage cannot prevent failure of the material due to fatigue; this is obviously due to the fact that the propagation and growth of the fatigue cracks formed in this stage is facilitated by the very fact of their acting as stress risers. It is therefore very likely that the marked scattering in the results of any series of fatigue tests is entirely due to factors affecting the process of failure in stage III. This has been confirmed by a series of tentative experiments in which reproducible results (with a scattering of $< 2\%$) were consistently obtained in stages I and II of the process. The

main conclusion of the present investigation is that no fatigue failure can occur unless the material has entered stage III of the process. This is of considerable practical importance since it provides a foolproof method of determining the safe number of cycles for any applied stress. The results obtained indicate that, since microstrains can develop in material to a cyclic stress lower than the fatigue limit (see Fig. 3), they cannot in themselves be regarded as dangerous (from the point of view of fatigue failure), or used as a fatigue criterion. For the latter purpose, that critical value of f_k of the ratio between elastically-deformed regions and plastically deformed microregions can be used at which multiple plastic macrostrains can develop. The value of f_k for steel 15 was found to be 0.25, which is almost equal to the value of f_k for this steel under a static load. There are 4 figures and 1 table.

ASSOCIATION: Volgogradskiy mekhanicheskiy institut
(Volgograd Mechanics Institute)

SUBMITTED: October 26, 1961

Card 6/7 C

GUR'YEV, A.V.

Strain gauge with automatic exclusion of the effect of specimen flexure. Izm.tekh. no.9:27-28 S '62. (MIRA 15:11)
(Strain gauges)

GUR'YEV, A.V.; KUKSA, L.V.

A peculiarity of steel deformation in the yield area following strain hardening. Fiz. met. i metalloved. 16 no.4:589-595 O '63. (MIRA 16:12)

1. Volgogradskiy mekhanicheskiy institut.

GUR'YEV, A.V., kand.tekhn.nauk; GEDBERG, M.G.; TERENT'YEV, S.G., inzh.; SHEPEL', L.T.

Causes of certain defects in the rolls used for cold rolling.
Stal' 23 no.5:438-440 My '63. (MIRA 16:5)

1. Zavod "Krasnyy Oktyabr'".
(Rolls (Iron mills)--Defects)

GOR'KOV, A. V., KOZLOV, L. V.

Plotting the effective curve of metal hardening from tensile and compression tests. Zav. lab. 30 no.10:1258-1259 '64. (MIRA 18:4)

1. Volgogradskiy politekhnicheskiy institut.

BERDIKOV, V.F.; GUR'YEV, A.V.; MALOVECHKO, G.V.

Attachment to the PMT-3 apparatus for automatic loading with a damping device. Zav. lab. 30 no.11:1398-1399 '64
(MIRA 18:1)

1. Volgogradskiy politekhnicheskiy institut.

L 1318-66 EWT(d)/EWT(m)/EWP(w)/EWP(i)/EWA(d)/T/EWP(t)/EWP(k)/EWP(z)/EWP(b)/EWA(c) MJW/JD/HW/EM

ACCESSION NR: AP5022174 UR/0032/65/031/009/1122/1123 620.170

AUTHOR: Gur"yev, A. V.; Kuksa, L. V.

TITLE: Method of studying the displacement of the plastic deformation front along the slip lines within the grains

SOURCE: Zavodskaya laboratoriya, v. 31, no. 9, 1965, 1122—1123

TOPIC TAGS: plastic deformation, ferritic steel, metal stress, stress analysis

ABSTRACT: Samples of 10 and 20 steel with pretreated surfaces were subjected to deformation. It is found that at low degrees of plastic deformation the slip lines can be observed only when the residual stresses are completely removed from the surface of the samples by repeatedly polishing and electropolishing (5 or 6 times). The presence of two types of slip lines is established in the ferrite grains. The character of the slip lines depends on the site of their formation on the surface of the sample. At points on the major axis of the ellipse (points A), the slip lines in the grains are distributed mainly at right angles to the axis of the sample; at points on the minor axis (points B), the slip lines are at a 45° angle to the axis. Measurement of the angle between the slip lines in the grain and the axis of the sample shows that the slip lines are located at an angle of

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L 1318-66
ACCESSION NR: AP5022174

70 to 90° to the axis of the sample in 70% of the grains at points A, and in only 18% at points B. This result confirms the presence of a close relationship between the external pattern of Lueder's lines and the slip lines in ferrite grains. Orig. art. has: 1 figure.

ASSOCIATION: Volgogradskiy politekhnicheskiy institut (Volgograd Polytechnic Institute)

SUBMITTED: 00 ENCL: 00 SUB CODE: MM, AS

NO REF SOV: 005 OTHER: 000

Card 2/2

L 18731-66 EWT(m)/EWA(d)/EWP(t)/EWP(k) JD/HW

ACC NR: AP6005144 SOURCE CODE: UR/0126/66/021/001/0116/0124

AUTHOR: Gur'yev, A. V.; Kuksa, L. V.

ORG: Volgograd Polytechnic Institute (Volgogradskiy politekhnicheskiy institut)

TITLE: Study of the interface between elastic and plastic deformation in steel

SOURCE: Fizika metallov i metallovedeniye, v. 21, no. 1, 1966, 116-124

TOPIC TAGS: plastic deformation, elastic deformation, steel, metal grain structure, ferrite

ABSTRACT: Cylindrical specimens of steels 10 and 20 annealed for an hour at 920°C (steel 10) and 900°C (steel 20) were subjected to low-degree plastic deformation and polished with the object of investigating the mechanism of this deformation. It was established that the formation of shear lines in ferrite grains during the initial stage of plastic deformation is accompanied by the transition of the specimen's shape from circular to elliptical. It is discovered that in most grains the shear lines run in the direction coinciding with the Lueders surface patterns. Plastic deformation of specimens with a creep plateau commences at one of the specimen's ends and then propagates lengthwise through it; by discontinuing the loading of the specimen it is possible to obtain a specimen with a plastically deformed part and a non-deformed part, separated by an interface. An overwhelming majority (92%) of the fer-

UDC: 548.0; 539

Card 1/2

L 18731-66

ACC NR: AP6005144

rite grains in the deformed part of the specimen joins in the plastic deformation; this is confirmed by a direct count of the grains with clearly visible slip bands and by measurements of microhardness in the grain body. The attendant formation of mobile dislocations leads to a sharp change in the elastic properties of the alloy: the linear dependence between stress and strain is upset and the instantaneous modulus of elasticity becomes essentially dependent on the stress level. Further, the feasibility of observing the processes involved in the onset of plastic deformation in individual ferrite grains is established. Orig. art. has: 9 figures.

SUB CODE: 11, 13, 20/ SUBM DATE: 25Jan65/ ORIG REF: 012/ OTH REF: 001

Card 2/2 Sm

L 02356-67 EWT(d)/EWT(m)/EWP(w)/EWP(c)/EWP(v)/T/EWP(t)ETI/EWP(k)/EWP(l) IJP(c)

ACC NR: AR6029506 JD SOURCE CODE: UR/0137/66/000/006/I043/I043

AUTHOR: Gur'yev, A. V.; Stolyarov, G. Yu.

TITLE: Characteristics of development and the accumulation pattern of defective areas in steel fatigue test

SOURCE: Ref. zh. Metallurgiya, Abs. 6I291

REF SOURCE: Sb. Materialy Nauchn. konferentsii. Sovnarkhoz Nizhne-Volzhsk. ekon. r-na. Volgogradsk. politekhn. in-t. T. I. Volgograd, 1965, 260-266

TOPIC TAGS: steel, fatigue test, low carbon steel

ABSTRACT: A method has been developed for detecting slip bands which develop in fatigue processes. On the basis of data obtained in testing low-carbon steel, it was concluded that, although the increase in the number of damages which precedes the fatigue breakdown is inevitable, its presence does not necessarily determine further development of dangerous fatigue cracks. [Translation of abstract].

SUB CODE: 11, 13/

Card 1/1 UDC: 539.43:669.01

L 10845-67 EWT(m)/EWP(w)/EWP(t)/ETI JD

ACC NR: AR6034736 SOURCE CODE: UR/0124/66/000/008/V073/V074

AUTHOR: Gur'yev, A. V.; Stolyarov, G. Yu.

TITLE: Nature of development and patterns of accumulation of failures in steel during fatigue tests

SOURCE: Ref. zh. Mekhanika, Abs. 8V641

REF SOURCE: Sb. Materialy Nauchn. konferentsii. Sovnarkhoz Nizhne-Volzhsk. ekon. r-na Volgogradsk. politekhn. in-t T. 1. Volgograd, 1965, 260-266

TOPIC TAGS: fatigue test, metal defect, fatigue failure, fatigue crack

ABSTRACT: A procedure has been worked out for detecting slip bands originating during fatigue tests. Cylindrical models 10 mm in diameter made of a low-carbon steel were subjected to the test by rotation and pure bending. It is concluded that the increase in the number of defective points is inevitable and precedes fatigue failure, but its existence is not a precondition for the development of dangerous fatigue cracks. Bibliography of 5 titles. V. Kolesnik. [Translation of abstract]

SUB CODE: 11/

Card 1/1

COUNTRY : USSR
CATEGORY : Cultivated Plants. Cereals. M

ABS. JOUR. : RZhBiol., No. 23, 1958, No. 104618

AUTHOR : Il'inskaya-Tsentilovich, M. A., Gur'yev, B. F.
INST. : Academy of Sciences USSR
TITLE : Varieties in Connection with Lodging.

ORIG. PUB. : Dokl. AN SSR, 1957, 113, No. 1, 217-219

ABSTRACT : Dynamics of the formation of attributes determining the resistance to lodging, differs in reclinate and slightly reclinate varieties of winter wheat (experiments at Kharkov Agricultural Institute). In the lodging variety Odesskaya 3, the thickness of the ring of textural tissue of the stem is less and the amount of its growth in the period between the stages of spiking and full ripeness changed very little in comparison with the non-lodging variety Lyutestsens 238.

Card: 1/1

GUR'YEV, Boris Konstantinovich

[People decide the fate of the harvest]Sud'bu urozhaia reshaiut liudi. Moskva, Sovetskaia Rossiia, 1961. 35 p.
(MIRA 16:2)
(Yaroslavl Province--Agriculture)

IL'INSKAYA-TSENTILOVICH, M.A.; GUR'YEV, B.P.

Development of the sturdiness of winter wheat stems under the influence of vegetative hybridization. Dokl.AN SSSR 94 no.4: 779-781 F '54. (MLRA 7:2)

1. Khar'kovskiy sel'skokhozyaystvennyy institut im. V.V.Dokucha-yeva. (Wheat)

GUR'YEV, B.P.

IL'INSKAYA-TSENTILOVICH, M.A.; GUR'YEV, B.P.

Peculiar features in the stem formation process in winter wheat varieties with regard to "lodging". Dokl. AN SSSR 113 no.1:217-219 Mr-Ap '57. (MIRA 10:6)

1. Khar'kovskiy sel'skokhozyaystvennyy institut im. V.V. Dokuchayeva. Predstavleno akademikom N.V. TSitsinym.
(Wheat)

GURYEV

~~Gunlyev~~, B.P., Cand Agr Sci--(diss) "Drooping of winter wheat varieties and ~~ways~~ plans of ~~strengthening the~~ forming stem stability stalk." Khar'kov, 1958. 18 pp (Min of Higher Education USSR. Khar'kov Order of Labor Red Banner Agr Inst im V.V. Dokuchayev), 150 copies (KL, 2?-58, 111)

M

[illegible] Tropical Cereals.

ABS. JOUR. : RZhBiol - BIOLOGIYA, NO. 4, 1959, No. 15578

AUTHOR : Il'inskaya-Tsentilovich, M.A.; Gur'yev, B.P.

INST. : Kharkov Agr. Inst.

TITLE : Problem of Evaluating Resistance to Lodging in Selections of Winter Wheat.

ORIG. PUB. : Zap. Khar'kovsk. s.-kh. in-ta, 1958, 15 (52), 69-74

ABSTRACT : For evaluation of the resistance of winter wheat to lodging, experiments were made in studying the course of stem formation in the varieties Odesskaya 3, Lutescens 966 and Lutescens 238. By investigation of the stem's anatomical structure, it was determined that the thickness of the ring of mechanical tissue in lodging varieties changes very little from the stooling stage to complete maturation. In the non-lodging varieties strengthening of the

CARD: 1/2

COUNTRY :

CATEGORY : CULTIVATED PLANTS.

M

ABS. JOUR. : REF ZHUR - BIOLOGIYA, NO. 4, 1959,

AUTHOR : No. 15578

INST. :

TITLE :

ORIG. PUB. :

ABSTRACT : elements of firmness occurs during the entire vegetation and especially in the period of ripening. The number of vascular-fibrous bundles and their diameter are considerably larger in the non-lodging varieties.

-- N.Ya. Vorontsova

CARD: 2/2

GUR'YEV, D.A., zasluzhennyy vrach RSFSR i Ykutskoy ASSR (Yakutsk, Oktyabr'skaya ul., 15,kv.3)

Pulmonary resection according to materials of the Municipal Tuberculosis Dispensary of Yakutsk. Vest. khir. 92 no.2: 56-58 F '64. (MIRA 17:9)

1. Iz legochno-khirurgicheskogo otdeleniya (zav.-D.A. Gur'yev) stationara Yakutskogo gorodskogo protivotuberkuleznogo dispansera (glavnyy vrach - zasluzhennyy vrach RSFSR i Ykutskoy ASSR L.S. Tauber).

MAMONTOV, I.M.; KONDAKOV, N.I.; ARKHIPOV, G.Ye.; SERGEYEV, A.S., kand. sel'khoz. nauk; PETROV, Ya.P.; GUR'YEV, D.G.; STUPALOV, Yu.G.; FIL'CHENKO, R.D., red.; PETROV, G.P., tekhn. red.

[Measures for protecting farm plants, fruit and berry plantations, and forests against pests and diseases in the Chuvash A.S.S.R. in 1962] Meropriiatiia po zashchite sel'skokhoziaistvennykh rastenii, plodovo-iagodnykh nasazhdenii i lesov ot vreditelei i boleznei po Chuvashskoi ASSR na 1962. 74 p. (MIRA 16:4)

1. Chuvash A.S.S.R. Ministerstvo proizvodstva i zagotovok sel'skokhozyaystvennykh produktov. Respublikanskaya stantsiya po zashchite rasteniy.

(Chuvashia—Plants, Protection of)

LUR'YE, Z.S., inzh.; KHEYFETS, S.Kh., inzh.; GUR'YEV, D.P., inzh.

Collapse of caked layers in fuel bunkers. Elek.sta. 32 no.8:25-28 Ag '61. (MIRA 14:10)
(Electric power plants) (Coaling-stations)

GUR'YEV, F. V.

GUR'YEV, F. V.- "Resistance to Freezing of Structural Brick and Methods of Increasing It." Min of Higher Education USSR, Ural' Polytechnic Inst imeni S. M. Kirov, Chair of Technology of Silicates, Sverdlovsk, 1955 (Dissertations For Degree of Candidate of Technical Sciences)

SO: Knizhnaya Letopis' No. 26, June 1955, Moscow

GUR'YEV, F., kand. tekhn.nauk; MAMYKIN, P., prof., doktor tekhn. nauk.

Freezing as applied to bricks. Stroi. mat. 3 no.12:29 D '57. (MIRA 11:2)
(Bricks--Testing)

GUR'YEV, F.V., kand. tekhn. nauk, dotsent

Frost resistance of structural clay brick. Trudy Ural. politekh. inst. no.117:30-39 '62. (MIRA 16:6)

(Bricks—Testing)

GUR'YEV, F.V., kand. tekhn. nauk, dotsent

Intensification of the process of drying brick. Trudy Ural. politekh. inst. no.117:40-46 '62. (MIRA 16:6)

(Bricks--Drying)

ACC NR: AR6033111 SOURCE CODE: UR/0137/66/000/007/I040/I040

AUTHOR: Gur'yev, G. V.

TITLE: Determining the rate of plastic deformation of steel during impact loading

SOURCE: Ref. zh. Metallurgiya, Abs. 7I258

REF SOURCE: Sb. Materialy Nauchn. konferentsii. Sovnarkhoz Nizhne-Volzhsk. ekon. r-na. Volgogradsk. politekhn. in-t. T. 1. Volgograd, 1965, 210-215

TOPIC TAGS: plastic deformation, steel, HF vibrator, deformation rate, impact loading, tensile test, indentation test

ABSTRACT: The rate of relative deformation $\dot{\varepsilon}$ of material subjected to the impact indentation of a spherical ball was calculated from the formula $\dot{\varepsilon} = \frac{1}{\tau} \cdot \frac{Ch}{h_s}$, where τ is the duration of the active period of the impact indentation process; h and h_s are the depth of the restored mark, and the depth of penetration of the plastic deformation under the mark, respectively; $C = f(h, h_s)$- are the alternating

Card 1/2 UDC: 539.4.019.1:669.14

ACC NR: AR6033111

proportionality coefficient, which depends on h and h_s. The τ value was recorded on the oscillogram through the registration of the oscillations generated by the high frequency vibrator. A linear dependence of τ from h has been determined for different steels and impact velocities. This relationship was used as basis for analyzing the deformation rate during the indentation, as equivalent to that during impact tensile tests performed at different impact velocities V. The tests were conducted on an impact-testing machine with a free-falling load. The results showed the linear dependence of $\dot{e}$ on V, the value of $\dot{e}$ increasing at a higher rate then V. The ratio $d\dot{e}/dV$ decreased with the growth of V, while with an increase in V, the increase of $\dot{e}$ became more intensive as the tested material became softer. The values $\dot{e}$ were different for the same V and for different deformation values. L. Ustinov. [Translation of abstract]

[GC]

SUB CODE: 11, 14, 09, 20/

Card 2/2

GUR'YEV, I.A.

For a fulfillment of the seven-year plan ahead of time. Kozh.-obuv.prom. 4 no.4:38 Ap '62. (MIRA 15:5)

1. Direktor kozhevennogo zavoda "Krasnyy gigant". (Klintsy--Leather industry)

GUR'YEV, I.A.; ZARINSKIY, V.A.

High frequency titration. Report No.8: Change of electric characteristics during reactions in nonaqueous media. Zhur.anal. khim. 18 no. 6:698-700 Je '63. (MIRA 16:9)

1. V.I.Vernadskiy Institute of Geochemistry and Analytical Chemistry , Academy of Sciences, U.S.S.R., Moscow and M.I.Kalinin Chernorechensky Chemical Plant, Dzerzhinsk.
(Conductometric analysis)

ZARINSKIY, V.A.; GUR'YEV, I.A.

High-frequency titration. Report No.9: Titration of acids in an acetic acid medium. Zhur. znal. khim. 18 no.11:1306-1313 N '63. (MIRA 17:1)

1. Institut geokhimii i analiticheskoy khimii imeni V.I. Vernadskogo AN SSSR, Moskva i chernorechenskiy khimicheskiy zavod imeni M.I. Kalinina, Dzerzhinsk.

ZARINSKIY, V.A.; GUR'YEV, I.A.

High-frequency titration. Report No. 1: Titration of acids in dioxane-aqueous media. Zhur. anal. khim. 19 no. 1:37-42 '64. (MIRA 17:5)

1. Institut geokhimii i analiticheskoy khimii imeni Vernadskogo AN SSSR, Moskva i TSentral'naya zavodskaya laboratoriya Chernorechenskogo khimicheskogo zavoda imeni Kalinina, Dzerzhinsk.

ZARINSKIY, V.A.; GURIYEV, I.A.

High-frequency titration Report 12: Indirect titration of acids in a dioxane aqueous medium. Zhur. anal. khim. 19 no.12:1429-1433 '64. (MIRA 18:1)

1. V.I. Vernadsky Institute of Geochemistry and Analytical Chemistry, Academy of Sciences of the U.S.S.R., and M.I. Kalinin Chemorechensky Chemical Plant, Dzerzhinsk.

ZARINSKIY, V.A.; GUR'YEV, I.A.

High-frequency method in organic analysis (survey). Zav. lab. 29 no.10:1157-1161 '63. (MIRA 16:12)

GUR'YEV, I.A.; STRONGIN, G.M.; FINKEL'SHTEYN, Kh.A.

Cryoscopic determination of the gamma-isomer content of hexachlorocyclohexane in a highly concentrated hexachloran. Trudy po khim.i khim.tekh. no.1:65-68 '63. (MIRA 17:12)

ZARINSKIY, V.A.; GUR'YEV, I.A.

High-frequency titration. Report No.13: Titration of acids in glycol media. Zhur. anal. khim. 20 no.3:294-298 '65. (MIRA 18:5)

1. Institut geokhimii i analiticheskoy khimii imeni Vernadskogo AN SSSR, Moskva i Chernorechenskiy khimicheskiy zavod imeni Kalinina, Dzerzhinsk.

GUR'YEV, I.A.; ZARINSKIY, V.A.

High-frequency method in production control. Determination of cyanuric acid. Trudy po khim.i khim.tekh. no.1:136-138 '64. (MIRA 18:12)

1. Submitted June 7, 1963.

KAYZERMAN, M.M., mayor meditsinskoy sluzhby; ZAVRAZHIN, M.K., podpolkovnik meditsinskoy sluzhby; KNYAZEV, S.V., podpolkovnik meditsinskoy sluzhby; KOBYAKOV, N.I., podpolkovnik meditsinskoy sluzhby; DOKUCHAYEV, G.M., podpolkovnik meditsinskoy sluzhby; PLETNEV, N.N., polkovnik meditsinskoy sluzhby; KHOROSHCHEV, V.D., podpolkovnik meditsinskoy sluzhby; GORBACHIK, Ye.D., podpolkovnik meditsinskoy sluzhby; DRUKER, Yu.S.; NAZAROV, K.M.; KOMOGOROV, P.R., polkovnik meditsinskoy sluzhby; KLIMENKO, A.V., podpolkovnik meditsinskoy sluzhby; RYAKHOVSKIY, I.Ye., podpolkovnik meditsinskoy sluzhby; IVAN'KOVICH, F.A.; GUBIN, S.V., kapitan meditsinskoy sluzhby; ZOTOV, I.G., kapitan meditsinskoy sluzhby; LEONOVA, Ye.I.; BUNTOVSKIY, P.A., mayor meditsinskoy sluzhby; GERASIMOV, A.N., podpolkovnik meditsinskoy sluzhby; GUR'YEV, I.A., kapitan meditsinskoy sluzhby; KOLDOBSKIY, S.Z., mayor meditsinskoy sluzhby

Abstracts. Voen. med. zhur. no.10:74-79 O '65.
(MIRA 18:11)

L 16960-66 EWP(k)/EWT(m)/T/EWP(w)/EWP(v)/EWP(t)/ETI IJP(c) JH/JD/HM

ACC NR: AT6024924 (A,N) SOURCE CODE: UR/2981/66/000/004/0152/0158

AUTHOR: Fridlyander, I. N.; Vlasova, T. A.; Skachkov, Yu. N.; Shiryayeva, N. V.; Surkova, Yu. I.; Gorokhova, T. A.; Pod', A. A.; Gur'yev, I. I.; Dzyubenko, M. V.

ORG: none

TITLE: Weldability of high-strength alloys of the Al-Zn-Mg-Cu system

SOURCE: Alyuminiyevyye splavy, no. 4, 1966. Zharoprochnyye i vysokoprochnyye splavy (Heat resistant and high-strength alloys), 152-158

TOPIC TAGS: aluminum zinc alloy, aluminum alloy property, weldability / V96 aluminum zinc alloy

ABSTRACT: The object of the work was to study the weldability in the fusion welding of V96 alloy, and also to determine whether the weldability of this alloy can be improved by changing the chemical composition of the base metal and filler wire. Sheets of V96 alloy 2.5 mm thick of the chemical composition 8.44% Zn, 2.72% Mg, 2.2% Cu, 0.06% Mn, 0.13% Zr, 0.29% Fe, and 0.13% Si were used in the experiments. In order to decrease the tendency toward crystallization cracks, the welding should be carried out with Al-Mg alloy fillers (of type AMg6). The content of the main alloying elements in the base metal should be kept within the following limits: 6.5-7.5% Zn; 2.7-3.5% Mg; 1.6-2.0% Cu; 0.15-0.22% Zr. However, even then the tendency of V96-type alloys to form cracks during welding remains higher than in commonly used alloys of the Al-Mg

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ACC NR: AT6024924

system (AMg3, AMg6). A considerable softening of the metal occurs in the heat-affected zone. The modulus of resistance of welded butt joints made by argon-arc welding is 0.5-0.6 of that of the base metal immediately after welding or after aging. Weld joints of V96-type alloys have a lower bending angle than those of other weldable aluminum alloys. The low plasticity of the joints may cause a low structural strength in welded structures. Orig. art. has: 4 tables.

SUB CODE: 11/ SUBM DATE: none/ ORIG REF: 002/ OTH REF: 001

Card 2/2

L 45463-65 EFR/EWP(k)/EWP(z)/EWA(c)/EWT(m)/EWP(b)/EWA(d)/EWP(t) Pf-4/Ps-4
IJP(c) IGW/JD/HW

ACCESSION NR: AP5009273 UR/0370/65/000/001/0160/0165

AUTHOR: Sviderskaya, Z. A. (Moscow); Rokhlin, L.L. (Moscow); Gur'yev, I.I.(Moscow); Oreshkina, A.A. (Moscow)

TITLE: Influence of plastic deformation between the operations of quenching and aging on the properties and structure of magnesium alloy MA5

SOURCE: AN SSSR. Izvestiya. Metally, no. 1, 1965, 160-165

TOPIC TAGS: magnesium alloy, aluminum containing alloy, plastic deformation, alloy strength, alloy heat treatment, alloy structure, alloy plasticity, work hardening, alloy conductivity

ABSTRACT: The authors studied the possibility of using plastic deformation between quenching and aging for the purpose of raising the strength characteristics of alloy MA5 (7.5-9.3% Al, 0.2-0.8% Zn, 0.5% Mn, impurities no more than 0.25% Si, 0.15% Cu, 0.15% Fe, bal. Mg). Quenching was done from 415C by cooling in air; the plastic deformation consisted of the extension of special blank specimens from which samples were made for tensile tests. It was found that plastic deformation between quenching and aging produces a definite increase in strength characteristics, but at the expense of a decrease in plasticity. Changes in the structure

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ACCESSION NR: AP5009273

of MA5 due to the deformation were studied by measuring the electrical resistance, by observing the microstructure, and by the x-ray method. A comparison of the results of mechanical tests and structural studies shows that the hardening of alloy MA5 by plastic deformation is due mainly to the formation of crystal lattice distortions which are characteristic of the work-hardened state. The decrease in hardening associated with a rise in the aging temperature or testing temperature is due to a partial elimination of these distortions, as was shown by x-ray analysis. Orig. art. has: 5 figures.

ASSOCIATION: None

SUBMITTED: 18Mar64 ENCL: 00 SUB CODE: MM

NO REF SOV: 014 OTHER: 000

Card 2/2

ZAKHAROV, Ye.D.; GUR'YEV, I.I.; SOLOV'YEVA, V.V.; DROKOVA, N.P.; GIL'DENGORN, I.S.; KHODAKOV, P.Ye.; BONDAREV, B.I.

Nonuniformity in continuously cast ingots and its effect on the quality of semifinished products. Alium. splavy no.3:371-382 '64. (MIRA 17:6)

ACCESSION NR: AT4037660 S/2981/64/000/003/0194/0200

AUTHOR: Fridlyander, I. N.; Romanova, O. A.; Archakova, Z. N.; Gur'yev, I. I.; Dronova, N. P.; Petrova, A. A.; By*chkova, Z. S.

TITLE: Preparation and testing of intermediate shapes from high-strength heat resistant aluminum alloy VAD23

SOURCE: Alyuminiyevy*ye splavy*, no. 3, 1964. Deformiruyemy*ye splavy* (Malleable alloys), 194-200

TOPIC TAGS: aluminum alloy, alloy VAD23, heat resistant aluminum alloy, high strength aluminum alloy, alloy mechanical property, hot pressed rod, hot pressed section, hot pressed strip, hot rolled sheet, cold rolled sheet, forged piece, double pressing

ABSTRACT: Immersion-cast ingots (diameter 260 mm) of alloy VAD23 (5.1-5.7% Cu, 1.2-1.4% Li, 0.096-0.11% Cd, 0.60-0.7% Mn, 0.15-0.25% Ti) were hot pressed (430-450C) into rods (intermediate diameter 127 mm or final diameter 20 mm), sections PR306-7, strips with 25x210 mm cross section and pressed panels. The pieces were water quenched from 525±5C, then aged 16 hours at 170C. Sheets 1.0, 1.5 and 2.0 mm thick were hot

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ACCESSION NR: AT4037660

rolled from strips to 6.0-5.5 mm, then cold rolled to desired thickness with intermediate annealing and finally heat treated (water quenched from 523±5C, aged 16 hours at 170±5C). Forgings (90 or 120x200x400 mm) were forged on a vertical press (deformation 65%, preheating 3 hours to 420-440C) from rods (diameter 180 mm) and heat treated as for sheets. Pressed shapes exhibited high tensile strength (66-70 kg/mm^2) at a relative elongation of 3-4%. It was noted that double pressing (i.e., into intermediate diameter rods, then final shape) reduced the tensile strength and increased the plasticity. Mechanical properties of sheets and forgings were lower than those of the pressed shapes. "K. N. Fomin, N. S. Lebedeva, P. G. Reznik, N. Averkina, L. S. Zheltovskaya, Yu. A. Vorob'yev and N. N. Tyurin also took part in the work." Orig. art. has: 7 tables.

ASSOCIATION: none

SUBMITTED: 00	DATE ACQ: 04Jun64	ENCL: 00
SUB CODE: MM	NO REF SOV: 000	OTHER: 000

Card 2/2

L 19754-63 EWP(k)/EWT(1)/EWP(q)/EWT(m)/EWP(B)/BDS AFFTC/ASD/BSD-3/IJP(C)

ACCESSION NR: AT3001943 P/-4 JD S/2912/62/000/000/0410/0419 32 30

AUTHORS: Chukhrov, M. V.; Sokolova, A. I.; Oreshnikov, Z. A.; Milyayev, B. F.; Gur'yev, I. I.; Bondarev, B. I.; Lukovnikov, Yu. D.

TITLE: Study of the effect of an electromagnetic field on the crystallization of light alloys

SOURCE: Kristallizatsiya i fazovyye perekhody. Minsk, Izd-vo AN BSSR, 1962, 410-419.

TOPIC TAGS: crystal, crystallization, crystallography, light,alloy, electromagnetic, field, magnetohydrodynamics, electromagnetohydrodynamics, electrodynamic, macrostructure, Al, Mg, A-00, MA-8, microstructure, strength characteristics, mechanical properties.

ABSTRACT: The paper describes an experimental investigation of a special effect of an electromagnetic field, namely, that of the electrodynamic forces created thereby, on the crystallization of metallic fusion. The effect comprises the e.m.f. and the electrical current that arise in a fusion bath above which a single-phase a.c. inductor is placed. The interaction of the electromagnetic fields of the inductor current and the current in the fusion produces electrodynamic forces which

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ACCESSION NR: AT3001943

impel the fusion to move. Tests were performed with Al of A-00 grade. The fused Al was poured at 710°C into stationary 165x540 mm molds, 50, 100, 150, and 200 mm high. The a.c. inductor was placed 20, 40, 60, and 80 mm above the surface of the fusion in the mold. Macrostructure investigations showed the refinement of the grains of the ingots. An especially refined structure was found in ingots 50 mm high. A removal of the inductor from the surface of the fusion of 60 to 80 mm resulted in some reduction of the refining effect. Analogous results were also obtained in tests with the Mg alloy Mark MA-8 (2% Mn, 0.3% Ce). Additional tests were made with semicontinuous casting of planar ingots of the same cross section and of the same two light metals. The principal effects investigated were the effect of the power fed to the inductor, the T and rate of pouring, and the height of the crystallizer on the grain-refinement effect. Al casting was performed in a crystallizer 170 and 270 mm at 690 and 710° at a rate of 7.5 and 9 cm/min. Ma ingots were cast in the same crystallizers and one 200 mm high, at T of 730 and 740°C and a casting rate of 5 to 6 cm/min. The presence of the electromagnetic field resulted in a stirring effect, and appreciable improvement of the grain structure was obtained (macroscopic photographs in orig. art.). The most powerful grain-structure-refining effect is observed at low casting T's and in the least high crystallizers. A T analysis performed by means of submerged Chromel-Alumel thermocouples showed a more uniform T distribution and decreased T

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ACCESSION NR: AT3001943

gradients upon the application of the electromagnetic field in the MA-8 alloy. Tabulated data on the mechanical properties of the MA-8 alloy cast under various conditions show a better uniformity of structure and more elevated values of the ultimate strength and elongation under the effect of the electromagnetic field. MA-8 ingots with the more uniform structure could be rolled without any risk of the formation of surficial microfissures. It is postulated that industrial equipments may have the inductors placed around the crystallizer to facilitate the work of the casting personnel. Orig. art. has 8 figures and 1 table.

ASSOCIATION: none

SUBMITTED: 00 DATE ACQ: 16Apr63 ENCL: 00

SUB CODE: CH, PH, MA, EL NO REF SOV: 000 OTHER: 000

Card 3/3

FRIDLYANDER, I.N.; ROMANOVA, O.A.; ARCHAKOVA, Z.N.; GUR'YEV, I.I.; DRONOVA, N.P.; PETROVA, A.A.; BYCHKOVA, Z.S.; Prinimali uchastiye: FOMIN, K.N.; LEBEDEVA, N.S.; REZNIK, P.G.; AVERKINA, N.; ZHELTOVSKAYA, L.S.; VOROB'YEV, Yu.A.; TYURIN, N.N.

Manufacture and investigation of semifinished products from high-strength and heat-resistant VAD23 aluminum alloys. Alium. splavy no.3:194-200 '64. (MIRA 17:6)

SEMKIN, R.M., inzh.; GUR'YEV, I.Ya., inzh.

Repair of TVF-200-2 and TGV-200 turbogenerators. Energetik 12 no.11:35-38 N '64 (MIRA 18:2)

L 37169-66 EWT(m)/T/EWP(t)/ETI IJP(c) JH/JG/GD/JD

ACC NR: AT6016419 (A) SOURCE CODE: UR/0000/65/000/000/0125/0134

AUTHORS: Drits, M. Ye.; Sviderskaya, Z. A.; Gur'yev, I. I.; Rokhlin, L. L.; Oreshkina, A. A.

ORG: none

TITLE: Influence of temperature on the mechanism of plastic deformation of magnesium and magnesium alloy containing 3% neodymium

SOURCE: AN SSSR. Institut metallurgii. Metallovodeniye legkikh splavov (Metallography of light alloys). Moscow, Izd-vo Nauka, 1965, 125-134

TOPIC TAGS: magnesium, magnesium alloy, neodymium containing alloy

ABSTRACT: The effect of temperature and additions of neodymium on the mechanism of plastic deformation of magnesium was investigated. The investigation supplements the results of Ye. M. Savitskiy, V. F. Terekhova, I. V. Burov, I. A. Markova, and O. P. Naumkin (Splavy redkozemel'nykh metallov. Izd-vo AN SSSR, 1962). The magnesium specimens were annealed at 425--450C for one hour. Specimens containing 3% neodymium were heated to 535C, quenched in water, and aged at 200C for 8 hours. The microstructure of the specimens was studied as a function of the annealing temperature and degree of deformation. The nature of the plastic deformation is different at high temperatures compared with low temperatures. The addition of 3% Nd to magnesium shifts the transition of the low-temperature plastic deformation mechanism to the

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L 37169-66

ACC NR: AT6016419

high-temperature mechanism by approximately 100C. It is concluded that the strengthening effect due to lattice deformation (which results from cold plastic deformation) persists up to 350C. Orig. art. has: 3 photographs.

SUB CODE: 11/ SUBM DATE: 16Sep65/ ORIG REF: 010/ OTH REF: 011

Card 2/2 af

L 37163-66 EWT(m)/EWP(w)/T/EWP(t)/ETI IJP(c) JD/GD

ACC NR: AT6016427 (A) SOURCE CODE: UR/0000/65/000/000/0184/0187

38
37

AUTHORS: Gur'yev, I. I.; Dzyubenko, M. I.; Demchinskaya, N. A.

ORG: none

TITLE: Investigation of the influence of the degree of recrystallization on the structure and properties of the alloys MA2-1 and MA8 18 15

SOURCE: AN SSSR. Institut metallurgii. Metallovedeniye legkikh splavov (Metallography of light alloys). Moscow, Izd-vo Nauka, 1965, 184-187

TOPIC TAGS: solid mechanical property, magnesium alloy/ MA2-1 magnesium alloy, MA8 magnesium alloy

ABSTRACT: The temperature intervals for the recrystallization of the alloys MA2-1 and MA8 as a function of the nature of their mechanical treatment (i.e., compression and rolling and the properties of the recrystallized alloys) were investigated. The experimental results are presented in graphs and tables (see Fig. 1). A direct relationship exists between the grain size of the alloys and their mechanical properties. It is suggested that the mechanical properties of the alloys may be controlled, within certain limits, by adjusting the alloy grain size. B. I. Ovechkin participated in the experimental work.

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L 37163-66

ACC NR: AT6016427

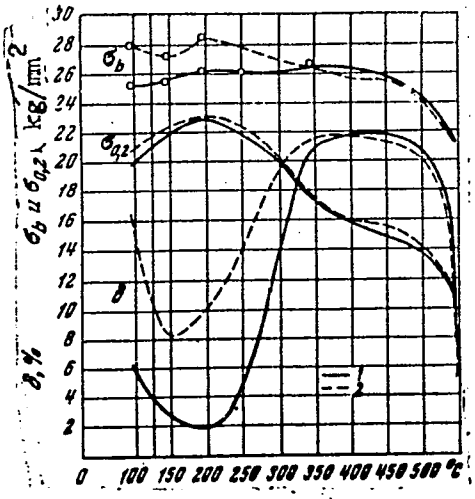

Fig. 1. Mechanical properties of sheets manufactured from alloy MA8 (cold deformation 30%, sheet thickness 1.4 mm) as a function of the annealing temperature. Specimens: 1 - longitudinal; 2 - transverse.

Orig. art. has: 1 table and 5 figures.

SUB CODE: 11/ SUBM DATE: 16Sep65

Card 2/2 af

L 40090-66 EWT(m)/EWP(w)/T/EWP(t)/ETI/EWP(k) IJP(c) JD/HW/JG/GD/JH

ACC NR: AT6016431 (A) SOURCE CODE: UR/0000/65/000/000/0217/0225

AUTHORS: Drits, M. Ye.; Gur'yev, I. I.; Vasil'yeva, N. I.; Ansyushina, A. Ye.

ORG: none

TITLE: Use of the method of thermomechanical processing for strengthening of semifinished products of alloy MA11

SOURCE: AN SSSR. Institut metallurgii. Metallovedeniye legkikh splavov (Metallography of light alloys). Moscow, Izd-vo Nauka, 1965, 217-225

TOPIC TAGS: fabricated structural metal, mechanical property, mechanical heat treatment, metallography, ~~metal industry~~, metallurgical process, magnesium alloy / MA11 magnesium alloy

ABSTRACT: The effect of thermomechanical processing on the mechanical properties of alloy MA11 was studied in production conditions for both rolled and forged semifinish products. The chemical content of the material investigated was: 2.48% Nd, 1.77% Mn, 0.13--0.17% Ni, 0.05% Mn, less than 0.03% Cu, 0.007% Fe, less than 0.07% Si, and the balance magnesium. Mechanical properties were studied at both room temperature and higher temperatures. The limit of prolonged strength and creep was determined for 200, 250, and 300C. It was shown that the thermomechanical processing results in the obtaining of higher values of strength properties both at room and at higher temperatures; especially significant was the increase in the flow limit. Some lowering of plasticity was noted; however, the plasticity remained at a sufficiently high level.

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L 40090-66

ACC NR: AT6016431

The optimal degree of deformation for achieving high strength and acceptable plasticity is 10--15% and varies with processing temperature. The increase in values of thermomechanical properties is associated with distortions in the material crystal lattice and with variation in the dissociation of supersaturated hard mixture. It was also found that the thermomechanical processing has a beneficial effect on the corrosion resistance of MA11. N. N. Kulakov, N. A. Markova, and A. A. Shesterikova participated in the work. Orig. art. has: 3 figures and 9 tables.

SUB CODE: 11, 13/ SUBM DATE: 16Sep65/ ORIG REF: 005

Card 2/2

L 07429-67

ACC NR: AP6030273

of the unit are given and the operating principle is described. The unit requires a 220 vac power supply at 50 cps. The oscillator consumes less than 75 w with a power transformer secondary voltage of 2300 v. The minimum hf open-circuit voltage is 5 kv and the maximum continuous welding current with series connection is 350 a. The overall dimensions of the instrument are 310×280×165 mm and the entire unit weighs less than 15 kg. A comparison with the OSTsN-2M oscillator shows that the ISO unit generates much less radio interference. Orig. art. has: 3 figures, 2 tables.

SUB CODE: 13, 09/ SUBM DATE: 22Mar66/ ORIG REF: 001

Card 2/2

ACC NR: AP6030273 (N) SOURCE CODE: UR/0125/66/000/008/0050/0053

AUTHOR: Gufan, R. M.; Zolotykh, V. T.; Budnik, N. M.; Martinovich, V. V.; Gur'yev, K. S.; Sapov, P. M.; Barilov, O. A.; Fel'dman, B. Z.

ORG: [Gufan, Zolotykh, Budnik, Martinovich] Rostov-na-Donu Institute of Agricultural Machine Building (Rostovskiy-na-Donu institut sel'khozmashinostroyeniya); [Gur'yev] Taganrog Electrical Equipment Plant (Taganrogskiy zavod elektrotekhnicheskogo oborudovaniya); [Sapov, Barilov, Fel'dman] "Rostsel'mash" Plant (Zavod "Rostsel'mash")

TITLE: The ISO universal welding oscillator

SOURCE: Avtomaticheskaya svarka, no. 8, 1966, 50-53

TOPIC TAGS: welding, hf oscillator, spark ignition, automatic welding, WELDING EQUIPMENT COMPONENT

ABSTRACT: The authors describe the new ISO spark welding oscillator developed on the basis of an experimental investigation of the operation of various types of oscillators. This is a general-purpose unit, i. e. it may be used both as a series and as a parallel oscillator. The unit should be connected in series for welding currents which do not exceed the value given in the specifications and in parallel for higher currents. The hot side of the power line is fused and the unit has a line filter, step-up power transformer with limiting resistors, spark oscillator circuit, high-frequency output transformer and output capacitor. A schematic diagram and photographs

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UDC: 621.791.03:621.3.072

GUR'EV, M. F.

(2)

Gur'ev, M. F., Stress distribution in a stretched isotropic finite rectangular plate weakened by a circular opening. Dopovidi Akad. Nauk Ukrain. RSR 1953, 133–139 (1953). (Ukrainian. Russian summary)

An approximate solution of the problem of stress concentration in a stretched elliptical plate weakened by a circular hole is obtained by constructing an integral equation for the auxiliary function, with the aid of which two analytical functions in the Muskhelišvili solution of the plane problem of elasticity can be calculated. The integral equation is approximated by a system of linear algebraic equations. The rectangular plate, referred to in the title of the paper, is deemed to be adequately approximated by an elliptical plate. *I. S. Sokolnikoff* (Los Angeles, Calif.).

12-4-54

124-58-9-10260

Translation from: Referativnyy zhurnal, Mekhanika, 1958, Nr 9, p 122 (USSR)

AUTHOR: Gur'yev [Hur'ev, M. F.]

TITLE: Stress Distribution Under Tension of an Isotropic Finite Rectangular Plate With a Circular Hole (Raspredeleniye napryazheniy v rastyagivayemoy izotropnoy konechnoy pryamougol'noy plastinke, oslablennoy krugovym otverstiyem) [Rozpodil napruzhen' u roztyahuvaniy izotropniy skinchenniy pryamokutniy plastyntsi, poslableniy kruhovym otvorom]

PERIODICAL: Nauk. zap. Poltavs'k. derzh. ped. in-t, 1955, Vol 8, pp 3-26

ABSTRACT: Bibliographic entry. Ref. Dopovidi AN UkrSSR, 1953, Nr 2, pp 133-139; RzhMekh, 1953, Nr 2, abstract 788

1. Plates--Stresses 2. Plates--Physical properties

Card 1/1

5(4)

AUTHORS: Gur'yev, M. V., Tikhomirov, M. V. SOV/76-32-12-12/32

TITLE: The Dissociation of Deuterooctane at an Electron Impact (Dissotsiatsiya deyterooktana pri elektronnom udare)

PERIODICAL: Zhurnal fizicheskoy khimii, 1958, Vol 32, Nr 12, pp 2731 - 2738 (USSR)

ABSTRACT: This is a comparison of the mass spectra of n-octane and n-octane-$2D_1$. The picture was taken with the mass spectrograph MS-1 at a ionization potential of 70 eV and an analyzer temperature of 150°. As expected, the deuterium reduces the probability of a break in the C-C binding, but to a much lesser extent than with polydeuterobutanes. Probably none of the CH_3-ions, and only half of the C_2H_5- and C_3H_7-ions are traced with deuterium. This theory, however, is contradicted by the test results. Thus, a great intramolecular mobility of the H-atoms, especially for the light ions and the formation of ions weaker in H is probable. Calculations of these variation possibilities correspond closely to the test

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results. Professor N. N. Tunitskiy was very helpful with his advice, and V. L. Tal'roze's cooperation was appreciated. There are 1 figure, 6 tables, and 14 references, 2 of which are Soviet.

ASSOCIATION: Fiziko-khimicheskiy institut im. L. Ya. Karpova Moskva (Physico-Chemical Institute imeni L. Ya. Karpov, Moscow)

SUBMITTED: October 17, 1957

5(4)

AUTHORS: Curtyev, M. V., Tikhomirov, M. V. and Tunitskiy, N. N. SOV/76-32-12-31/32

TITLE: On the Mass Spectra of Large Molecules (O mass-spektrakh bol'shikh molekul)

PERIODICAL: Zhurnal fizicheskoy khimii, 1958, Vol 32, Nr 12, pp 2847-2847 (USSR)

ABSTRACT: For the purpose of investigating the dissociation processes in the case of an electron impact, mass spectra of n-nonane marked at a definite point with C^{13} (n-nonane-$5C^{13}$) were taken. By comparing them with the mass spectra of normal n-nonane the proportion of ions containing C^{13} was determined. The results can only be explained by assuming that the fragment ions form by a breaking of the binding between 2 carbon atoms. The molecule is broken in most cases into 3 fragments with C-atoms. The ions forming are strongly stimulated. Test results show that the stimulation energy of the initial ion, up to the moment of dissociation, can only spread to part of its degrees of freedom whereas H. Eyring (Ref 3) assumed a statistical distribution of

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the energy to all degrees of freedom. There are 1 table and 4 references, 1 of which is Soviet.

ASSOCIATION: Fiziko-khimicheskiy institut im. L. Ya. Karpova, Moskva (Physico-Chemical Institute imeni L. Ya. Karpov, Moscow)

SUBMITTED: May 25, 1958

5(4)

AUTHORS: Gur'yev, M. V., Tikhomirov, M. V., Tunitskiy, N. N.

SOV/20-123-1-32/56

TITLE: On the Mass Spectra of Large Molecules (O mass-spektrakh krupnykh molekul)

PERIODICAL: Doklady Akademii nauk SSSR, 1958, Vol 123, Nr 1, pp 120-122 (USSR)

ABSTRACT: It is known that the bombarding of polyatomic molecules by electrons (energy 50-100 eV) leads to the ionization and dissociation of these molecules. In order to make it possible to draw unique conclusions concerning the mechanism of dissociation, the authors investigated the mass spectrum of n-nonane-5C^{13}. Carbon monoxide containing 51% C^{13} was used for the synthesis. The scheme for the synthesis is given.

The nonane and n-nonane-5C^{13} mass spectra, which were corrected to their natural content of C^{13} and were determined under the usual conditions by means of the device MI-1303, are given in a table. A second table shows the percentages of the ions containing C^{13}. If the molecule of n-nonane-5 C^{13} were

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dissociated by a simple stripping of bonds, the ions of the type $C_2H_5^+$, $C_3H_7^+$, $C_4H_9^+$ would contain no carbon C^{13}. The fragment-like ions of other types are essentially formed by the stripping of hydrogen atoms from the original ions. In general, the dissociation of large molecules in an electron collision develops as follows: First, "head ions" ("golovnyye" iony) are produced with equal probability from all parts of the molecule (by the capture of a hydrogen atom) with an even number of ions. Next, some of these ions decay, accompanied by the stripping of hydrogen ions, and they form a complete mass spectrum of the substance. These facts correspond to the conclusions drawn from the investigations of the mass spectra from large molecules. At present the following is assumed: The excitation energy is distributed over the entire molecule after the electron collision and this molecule then dissociates according to the decay law. The authors from this point of view investigated 2 molecules of normal structure, as e.g. n-hexane C_6H_{14} and n-tetratetracontane $C_{44}H_{90}$. Contrary to expectations, the experiments showed the following: The larger the molecule (in the case of equal structure) the smaller will be

the content of molecular ions in its mass spectrum. Thus, the existence of even the mass spectra of large molecules must be explained by the fact that the energy transmitted by the electron cannot propagate over the entire molecule (before its dissociation). This supposition agrees with data concerning the investigation of initial ranges of ionization curves (Ref 7), and it makes it possible to explain the results obtained by the authors: If the electron incides with equal probability upon any part of the molecule, and if the energy transmitted by it is propagated before dissociation only within a small part of the molecule, it is just this part of the molecule that is "knocked out" in form of a fragment-ion. The ions produced in this way contain the main portion of the excitation energy and therefore dissociate easily accompanied with the stripping of hydrogen atoms. There are 2 tables and 7 references, 1 of which is Soviet.

PRESENTED: June 26, 1958, by V. A. Kargin, Academician

SUBMITTED: June 24, 1958

GUR'YEV, M. V.: Master Chem Sci (diss) -- "The dissociation of large molecules under electron impact". Moscow, 1959. 10 pp (State Committee of the Council of Ministers USSR for Chem, Phys-Chem Inst im L. Ya. Karpov), 110 copies

(KL, No 13, 1959, 100)

GUR'YEV, M.G.

Exchange of work practices by the spinning machine operators of the woolen industry. Tekst. prom. 25 no.12:7-9 D '65.
(MIRA 19:1)

1. Nachal'nik normativno-issledovatel'skoy laboratorii po trudu pri Moskovskoy kamvol'no-pryadil'noy fabrike imeni M.I. Kalinina.

82833
S/048/60/024/008/010/017
B012/B067

24.6100

AUTHORS: Gur'yev, M. V., Tikhomirov, M. V., Tunitskiy, N. N.

TITLE: Dissociation of Large Molecules in Electron Impact

PERIODICAL: Izvestiya Akademii nauk SSSR. Seriya fizicheskaya, 1960, Vol. 24, No. 8, pp. 975-978

TEXT: The present paper generally deals with the interaction between an electron and a large molecule. Usually, it is assumed in such a case that the molecular ion takes part in the dissociation as a whole. The calculations of the authors (Ref. 6) showed, however, that also with usual electron energies (~70 ev) the large molecules (C_{44}) may dissociate not in the same way as is the case in the experiments. A hypothesis is suggested to explain this fact. It says that in the processes accompanied by a dissociation of the molecule only a limited number of vibrational degrees of freedom is excited and that dissociation takes place in the region of excitation. It is demonstrated that this hypothesis can be accurately controlled. It is pointed out

Dissociation of Large Molecules in Electron Impact

that if the electron "arrives" with approximately equal probability in any part of the molecule and if the excitation energy transmitted by this electron is distributed only over a small part of the molecule - in the dissociation exactly this part of the molecule would be bound to "fall out" in the form of a fragment ion. Hence, the fragment ions would be bound to form with equal probability from any part of the molecule. The experiments conducted by the authors confirmed that the main fragment ions are actually formed in this way. It is pointed out that this is the case in the entire range from 1000 ev to energies which are by 1 ÷ 2 ev above the potential at which the corresponding ion is formed. The investigations of the mass spectra in the case of such high electron energies were conducted by Yu. M. Miller. The experiments made by the authors showed that the mass spectra of the molecules investigated are equal not only at 50 ÷ 70 ev but also at any electron energy. This proves that the interaction between electron and molecule is independent of the dimensions of the molecule which confirms the hypothesis on the "local" character of this interaction. In conclusion, considerations are made for the case of double bonds and other possible couplings of bonds

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Dissociation of Large Molecules in Electron Impact

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B012/B067

in the molecule. There are 1 figure and 10 references: 4 Soviet and 6 British.

ASSOCIATION: Fiziko-khimicheskiy institut im. L. Ya. Karpova (Physicochemical Institute im. L. Ya. Karpov)

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S/020/61/136/004/019/026
B028/B060

AUTHOR: Gur'yev, M. V.

TITLE: Mass Spectra and Primary Processes in the Radiochemistry of Paraffins

PERIODICAL: Doklady Akademii nauk SSSR, 1961, Vol. 136, No. 4, pp. 856-859

TEXT: Experiments for the quantitative explanation of mass spectra of complicated molecules have been hitherto conducted only on the basis of the statistical theory, namely, on the assumption of molecular ions dissociating with time (up to $\approx 10^{-6}$ sec), after ionization and excitation. It was shown in connection with this theory that a complete new distribution takes place with time, caused by the transfer of the excitation energy over all molecules. This gives rise to dissociation by the random energy concentration on one or the other compound. By another theory it has been tried to explain the rules governing the mass spectra of the molecular group dissociation as being caused by electron

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